

CLAIMS:

1. A system for controlling an axial movement of an article, the system comprising:

- a support stage assembly;
- 5 - a spring suspension arrangement mounted on said support stage assembly and comprising first and second assemblies arranged in a coaxial relationship one inside the other, the first assembly being attached to said support stage assembly and the second assembly serving for supporting an article-carrying member and being driven for movement along said axis
- 10 with respect to the first assembly, the outer one of the first and second assemblies being configured to define two spaced-apart parallel planes perpendicular to said axis, said first and second assemblies being attached to each other by first and second membrane-like members arranged in a spaced-apart parallel relationship along said axis.

15 2. The system of Claim 1, comprising a drive assembly associated with said first assembly and operable to provide said movement thereof along said axis.

3. The system of Claim 1, wherein said outer assembly is attached to the support stage assembly, and said inner assembly is driven for movement along said axis.

20 4. The system of Claim 1, wherein said inner assembly is attached to the support stage assembly, and said outer assembly is driven for movement along said axis.

5. The system of Claim 1, wherein said outer assembly is composed of at least three spaced-apart pin-like members kept at a fixed position with respect to one another, and said inner assembly is composed of at least one pin-like member.

25 6. The system of Claim 5, wherein an arrangement of said at least three fixed members of the outer assembly defines a regular polygon, and the pin-like member of the inner assembly is located substantially at the center of said polygon.

7. The system of Claim 1, wherein the outer and inner assemblies have substantially the same height.

8. The system of Claim 1, wherein said outer and inner assemblies are configured as cylinders or prisms.

5 9. The system of Claim 8, wherein the inner assembly at its top and bottom is attached to the top and bottom of the outer assembly by said first and second membrane-like members, respectively.

10. The system of Claim 9, wherein said membrane-like members have substantially annular geometry.

10 11. The system of Claim 9, wherein said membrane-like members are clamped to the opposite sides of each of the outer and inner assemblies via clamping rings.

12. The system of Claim 8, wherein said inner assembly is driven for said movement with respect to the outer assembly, said outer assembly being attached to the support stage assembly.

15 13. The system of Claim 8, wherein the outer assembly is driven for said movement with respect to the inner assembly, said inner assembly being attached to the support stage assembly.

14. The system of Claim 1, comprising the article-carrying member mounted on the second assembly for rotation with respect to said second assembly, the system being thereby operable as a Z-Theta-system.

15. The system of Claim 1, wherein said support stage assembly is driven for movement in a plane perpendicular to said axis.

16. The system of Claim 14, wherein said support stage assembly is driven for movement in a plane perpendicular to the Z-axis, the system being thereby operable
25 as a Z-R-Theta- system.

17. The system of Claim 16 for use in transfer and positioning of a disk-like article with respect to said axis, wherein the support stage assembly is movable along a perpendicular axis for a distance of at least a radius of the article.

18. The system of Claim 1, wherein the article-carrying member is mounted on
30 a central axis of said second assembly by means of a pair of spherical washers

facing each other by their male and female surfaces, respectively, thereby enabling precise positioning of the article-carrying member in a plane perpendicular to said axis.

19. The system of Claim 2, wherein said drive assembly comprises a mechanical pair formed by a roller bearing mounted on a tapered surface of the wedge element; and a motor operable for moving the wedge element along an axis perpendicular to said axis.

20. A system for controlling movement of an article along at least a vertical axis, the system comprising:

- 10 - a support stage assembly;
- a spring suspension arrangement mounted on said support stage assembly and comprising first and second vertically oriented cylindrical assemblies arranged in a coaxial relationship one inside the other, the first assembly being attached to said support stage assembly and the second assembly serving for supporting an article-carrying member and being driven for movement along the vertical axis with respect to the first assembly, the inner cylindrical assembly at its top and bottom being attached to the top and bottom of the outer cylindrical assembly by, respectively, first and second membrane-like members thereby arranged in a spaced-apart parallel relationship along the vertical axis.

21. The system of Claim 20, comprising a drive assembly associated with said second cylindrical assembly and operable to provide said movement thereof along the vertical axis.

22. The system of Claim 20, wherein said support stage assembly is driven for movement along at least one horizontal axis.

23. The system of Claim 20, comprising the article-carrying member mounted on said second cylindrical assembly and driven for rotation with respect to said first cylindrical assembly.

24. A system for controlling movement of an article along at least a vertical axis, the system comprising:

- a support stage assembly;
- a spring suspension arrangement mounted on said support stage assembly and comprising first and second vertically oriented cylindrical assemblies arranged in a coaxial relationship one inside the other, the outer cylindrical assembly being attached to said support stage assembly and the inner cylindrical assembly serving for supporting an article-carrying member and being driven for movement along the vertical axis with respect to the outer assembly, the inner cylindrical assembly at its top and bottom being attached to the top and bottom of the outer cylindrical assembly by, respectively, first and second membrane-like members being thereby arranged in a spaced-apart parallel relationship along the vertical axis,
- a drive assembly associated with said inner cylindrical assembly and operable to provide said movement thereof.

25. An R-Theta-Z system for controlling movement of an article along the Z-axis and in a horizontal plane, the system comprising:

- a support stage assembly driven for movement along a horizontal axis;
- a spring suspension arrangement mounted on said support stage assembly and comprising first and second vertically oriented cylindrical assemblies arranged in a coaxial relationship one inside the other, the first assembly being attached to said support stage assembly, and the second assembly serving for supporting an article-carrying member and being driven for movement along the vertical axis with respect to the first assembly, said article-carrying member being driven for rotation in the horizontal plane, the inner cylindrical assembly at its top and bottom being attached to the top and bottom of the outer cylindrical assembly by, respectively, first and second membrane-like members thereby arranged in a spaced-apart parallel relationship along the vertical axis.

26. An X-Y-Theta-Z system for controlling movement of an article along the Z-axis and in the horizontal X-Y-plane, the system comprising:

- a support stage assembly driven for movement along X-and Y-axes;

- a spring suspension arrangement mounted on said support stage assembly and comprising first and second vertically oriented cylindrical assemblies arranged in a coaxial relationship one inside the other, the first assembly being attached to said support stage assembly, and the second assembly serving for supporting an article-carrying member and being driven for movement along the vertical axis with respect to the first assembly, said article-carrying member being driven for rotation in the horizontal plane, the inner cylindrical assembly at its top and bottom being attached to the top and bottom of the outer cylindrical assembly by, respectively, first and second membrane-like members thereby arranged in a spaced-apart parallel relationship along the vertical axis.